

October 18,2020

To: Leelanau County Drain Commission Board of Determination

Subject: South Bar Lake Drain-Petition to Locate, Establish and Construct a New County Drain

The Village of Empire is pleased to support the establishment of the proposed Drainage District. The Village, after thorough review and vote by the Village Council, submitted an “Application For Laying Out And Designating A County Drainage District”. The necessity and sufficiency for the establishment of the Drainage District is addressed and supporting slides are attached.

Background:

The Village of Empire is located in the southwest corner of Leelanau County in the heart of Sleeping Bear Dunes National Lakeshore. The Village is home to the National Park Headquarters and Visitors Center. The park annually attracts over 1.6 million visitors. The Village has a population of approximately 370 residents and encompasses 1.1 square miles. It is within Empire Township which has a population of approximately 1,108 (including the Village) and covers 42.8 square miles.

Empire is a historic residential village with diverse locally- owned businesses and Empire Beach Park. The Beach Park provides public access to both Lake Michigan and the southwest shore of South Bar Lake. It is a unique, valued regional recreational asset with both inland lake and Lake Michigan access/boat ramps.

The area watershed drains through South Bar Lake into Lake Michigan. The current South Bar Lake “drain” is the issue supporting the Drainage District application. The current drainage is not effective and a new “drain” is needed. The nature of the problem, its source and complexity make this issue best addressed by a drainage district.

Existing Condition:

South Bar Lake drainage to Lake Michigan passes through a single point, referred to as the “outlet”. The current outlet drain is a 5-foot diameter, 28-foot-long corrugated steel culvert which drains the lake, under S. Lake Michigan Drive, onto

the beach and into Lake Michigan. There is a level control block and weir set at 582.1' elevation at the east culvert entrance. A normal steady state flow is about 8-10" in height above the weir.

The existing drainage culvert is not effective or sustainable in a coastal environment of changing lake levels, extreme wind and wave conditions. High Lake Michigan water levels, turbulent shoreline scouring, and predominant wind patterns cause continuous drifting sand. This occurs higher up the beach due to the higher Lake Michigan levels. The result is the South Bar outlet drain frequently plugs on the Lake Michigan side. At the same time, the design of the drain coupled with high seas can lead to water cascading over S. Lake Michigan Drive. The drain blockage and sand movement can be substantial. Periods of high winds and rough seas can, in a few hours, bring in 3-5 feet of sand totally covering, filling and blocking the culvert. Blocked drainage occurs year-round, often 2-3 times per week.

The Village of Empire's current practice is to manually unplug the outlet drain and remove sand that blocks the flow of water from the culvert to Lake Michigan. In the past year (Oct 1, 2019—Oct 1, 2020) the South Bar outlet drain has required manual clearing 130 times requiring 275 Village labor hours. A shovel, backhoe, and sometimes use of a firehose is required to clear the culvert. Two people and hundreds of labor hours are diverted from other Village projects. This has taken a toll on the equipment and the Village budget. This "fireman reaction" approach is ineffective and unsustainable. This condition puts a disproportionate burden on the Village as no one else in the watershed contributes to this maintenance. Future budget constraints may cause less Village resources to be available.

When the culvert is plugged, the adjacent South Bar Lake level increases approximately 1.5" per day through groundwater interflow, surface water runoff and incoming stream flows. The inflows are from the entire watershed. The watershed has no "up-gradient" controls, so South Bar Lake is the final receptor and pivot point for a groundwater driven drainage system. The drainage outflow to Lake Michigan is almost entirely through the outlet drain. Maintaining flow is essential for the stability of the watershed and its drainage system.

Lake Michigan high winds, waves and saturated unstable sand can create dangerous conditions. This, and adverse weather make it impractical to clear the

outlet for days. A plugged drainage outlet has increased the South Bar Lake levels 5" over a weekend. When a period of extended plugging is followed by short periods of open flow, South Bar Lake level builds up and has reached 24-27" above the weir, far above the desired steady state level of 10". This creates flooding conditions on all sides of the lake adversely impacting access roads, driveways, public and private property.

Blocking incoming stream flows from entering South Bar Lake is not feasible or permissible and would be ineffective since most of South Bar Lake's flow is groundwater dependent.

Lake Michigan levels cyclically rise and fall with recent levels at record highs. Future climate changes and Lake Michigan levels are unpredictable. A properly designed drain, which will function through all weather and sea conditions is needed. This is the responsible action of a strategic, visionary government.

Proposed Drainage District:

The proposed drainage district watershed encompasses an area across the village, township, county and state roads. It includes most properties in Empire Village and a portion of properties in Empire Township. A functioning South Bar lake drain benefits the entire watershed. A drainage district can assess properties in the district and associated governments for the construction and maintenance of a new South Bar Lake drain. Properties outside the district are not required to participate in project funding. Over 800 properties are potentially involved.

Drainage problems such as this are not popular but need to be solved. No one governmental unit is responsible for or can best fund, maintain and manage the drain required. A drainage district spreads across the widest possible tax base of those within the drainage system. It is a common approach in other parts of the state, just not as much in Leelanau County.

A functioning drainage system and South Bar Lake outlet drain is needed for the Public Health, Convenience, or Welfare of the Community.

Public Health, Convenience or Welfare of the Community:

Functioning, reliable drainage is a fundamental public health component, that includes preventative and sanitary practices avoiding static septic water conditions. Citizens deserve a well-planned and constructed drainage system that is responsive to area land use and weather conditions.

South Bar Lake, Empire Beach Park and Lake Michigan are valued community resources that support the welfare, economic well-being, health and enjoyment of the community. A new drain will not only benefit properties in the watershed but will benefit the regional community and visitors who enjoy the natural environment of Leelanau County.

A functioning South Bar Lake drain is required to maintain the environmental balance and relationship of South Bar Lake, Empire Beach and Lake Michigan. It is a necessary component to keep the entire watershed drainage system working and in balance. A new drain, designed to meet weather and sea conditions, will prevent unacceptable South Bar Lake levels and eliminate the current disruption, cost and safety concerns. High South Bar Lake levels impact the local water table and can create flooding conditions on property and essential roads which are used for day to day access and for emergency responders.

The welfare of the community, in respect to good fortune, happiness, prosperity and economic well-being, is dependent on a functioning drain.

Conclusions:

1. The existing South Bar Lake drain is ineffective and necessitates maintenance that is unsustainable, costly and inefficient.
2. A new engineered South Bar Lake drain is needed and conducive to the “Public Health, Convenience, or Welfare” of the Community.
3. No one governmental unit is responsible for or can best, design, fund and maintain the drain required. It does not lend itself to merely a Village based solution since South Bar Lake and the contributing watershed are not within a single governmental body. The watershed includes many residents of the Village of Empire and Empire Township.

4. A drainage district is best suited to address the need for a new South Bar Lake drain. The provisions of a Drainage District allocate costs based on benefits to the district. Properties not in the proposed drainage district will not be assessed.

5. The Michigan “Drain Code of 1956” provides for this solution.

The Village of Empire strongly endorses and requests the approval of the proposed Drainage District and new South Bar Lake Drain.

We appreciate your consideration of this important matter.

Soni Aylsworth
President
Village of Empire
Empire, Michigan

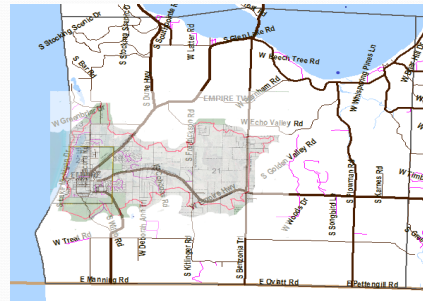
Village of Empire

DRAINAGE DISTRICT BOARD OF DETERMINATION OCTOBER 22, 2020

SONI AYLSWORTH
PRESIDENT,
VILLAGE OF EMPIRE

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DRAINAGE DISTRICT (GRAY) OVERLAYED ON EMPIRE TOWNSHIP



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Existing Condition

- Watershed Drains to South Bar Lake
- South Bar Lake drains to Lake Michigan
- South Bar Lake Outlet Drain
 - 5 foot corrugated steel culvert under road,
 - Drain Plugs with sand 2-3 times per week

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Existing Drainage Culvert



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Village of Empire

Culvert Drains to Lake Michigan



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Plugged Outlet Culvert Full, Channel Gone



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South Bar Lake Drain Unplugging (One Year)

Month	Times Unplugged	Labor hours
Oct 2019	8	32
Nov 2019	12	44
Dec 2019	14	39
Jan 2020	16	40
Feb 2020	13	20
Mar 2020	14	22
Apr 2020	7	9
May 2020	5	6
Jun 2020	10	19
Jul 2020	9	12
Aug 2020	14	20
Sep 2020	8	12

Total 130 times 275 hours

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Plugged Drain Impacts

- Past year, 130 times needed to clear drain
 - 275 Village manhours and extensive equipment needed
 - Firehose, backhoe and shovel used to open Drain
 - Diverts resources from other Village projects
- Watershed drainage backs up
- South Bar Lake level rises 1.5" per day when plugged
- Creates flooding/high water problems
- Weather, safety concerns can prevent clearing Drain for Days, increasing impacts

Two Typical Examples in 2020

Winter Jan 23rd
Labor day Weekend Sep 7

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Village of Empire

Jan 23, 2020 Drain Plugged, Channel Closed
Two Workers, Firehose, Equipment Required



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Clearing Culvert with Firehose
Jan 23, 2020



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Trenching channel to Lake Michigan
Jan 23, 2020



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Outlet Drain Flowing to Lake Michigan



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Village of Empire

Labor Day Sep 7, 2020
Drain Plugged, Channel Covered



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Local Dock Underwater
Sep 7, 2020



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Water around Garage
Sep 7, 2020



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Empire Beach Park
Swim Dock and Picnic Area
Sep 7, 2020



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Village of Empire

Public Boat Ramp Unusable
South Bar Lake Sep 7, 2020



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South Bar Level Indicator 2.25' = 27"
Sep 8, 2020 7:00 AM



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Channel Opened, Drain flowing to Lake Michigan
Sep 8, 2020 11:00 AM



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Following Day Sep 9, 2020
Level Indicator 1.62' = 19" (Drop of 8" in one day)



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Village of Empire

Plugging Continues Oct 17, 2020



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Drainage District

- South Bar Lake Drain needs to be replaced
- Functioning drainage benefits the entire watershed
- Drainage District is the appropriate means to address the South Bar Lake Drain
- No one existing governmental unit is responsible
- Drainage district includes properties in the watershed
 - Most of the Village of Empire
 - A portion of Empire Township
- Properties in the district participate in solution
- Properties not in the district do not pay

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“Public Health, Convenience or Welfare” of the Community

- Functioning reliable drainage is fundamental to sanitary conditions and public health.
- A new drain benefits the entire watershed
- South Bar Lake, Empire Beach, Lake Michigan and the natural environment are valued resources supporting health, welfare, economic well-being and enjoyment of the community
- Functioning South Bar Lake Drain is required to keep the watershed drainage system working and in balance
- Functioning Drain maintains water levels preventing flooding conditions impacting property access and use
- Welfare of the community is dependent on a functioning drain

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Conclusions

- Existing South Bar Lake Drain is ineffective
- A new South Bar Lake Drain is needed for “public health, convenience or welfare” of the community
- No one governmental unit is responsible for or can best design, construct and maintain the “Drain” required.
- A Drainage District is best suited for this need
- Drain Code of 1956 provides for this solution

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